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Book Reviews

Germline Development (Ciba Foundation Symposium 182); edited by J. Marsh and J. Goode, Wiley; Chichester, 1994; ix + 321 pages. $47.50. ISBN 0 471 94264 2.

CIBA Foundation Symposia often have a significant impact on the development of a field of interest, and those of which I have had the good fortune to attend have been highly stimulating, rewarding and the best of meetings. A second best is to be able to read their report, for not only are the individual papers recorded but also the intervening discussion. The inclusion of the discussion gives the virtual attendee a semblance of the reality of the meeting, and the discussions not only add critique but often bring out much fascinating extra information.

This volume lives up to all the expectations for a reader wishing to enter the virtual reality of a CIBA symposium and moreover presents a fascinating area of interest to all biologists, the germ cell/soma divide and germ cell differentiation and development.

Dr. Ken Simpkiss in the discussion of the first paper by Kirk on germ cell specification in *Volvox*, puts the critique of the field into sharp focus when he says that he is worried that the whole concept of the symposium seems to be that the germ line is different 'The idea that cells are immortalized seems to me a re-statement of the fact that we are looking at reproductive systems and doesn't have any greater implication than that. More worrying is the possibility that the Weismann concept of a continuity of the germ plasm seems to be driving the design of experiments – if the germ line is different in any way it is in the eventual recovery of totipotency from two differentiated gametes. By concentrating on the differentiation of the germ line, we may be posing all the wrong questions for understanding what is most interesting about this cell lineage'.

The chapter on the mechanism of germ cell specification in *Volvox carteri* is followed by chapters on specification of the germ line and development of germ cells in *Caenorhabditis elegans*, in birds and in mammals. This section is brought to a useful theoretical compilation by K.E. Dixon, who suggests that the sites of origin and segregation of the germ cells across the species correlates with the mode of development, and that germ cells appear to be segregated in locations or at times that exclude them from the process of specification of the adult body. In other words, they avoid other differentiative signals. He suggests, moreover, that the specific germ plasm mechanism is restricted to embryos where it would otherwise be difficult to segregate the germ cells because of rapid development or because of pervasive genetic signals, and that the germplasm is providing an extra insulation of the germ cell nuclei from these processes. As Anne McLaren summarises it in the lively discussion that followed 'germ plasm is a safety net' and it is clear that these ideas were acting as a considerable stimulus to constructive thought.

There follow chapters on germ cell migration and interactions with their cellular substrates in mice, leading on to a description by Brigid Hogan of the isolation of embryonic germ cell lines. These cells have most of the properties of ES cells but show differences in the IGF2 receptor genomic imprinting. It will be interesting to see whether this is a pivotal difference or merely reflects the particular cell lines examined.

Much of the rest of the volume is devoted to fascinating chapters on the differentiation of germ cells in different species, both oogenesis and spermatogenesis, and in *Caeonorhabditis* and *Drosophila* where most genetic analyses of some of the factors involved have been possible.

Finally we return to germplasm with a chapter from Ruth Lehmann and Anne Ephrussi on the role of the product of the oskar gene in germ plasm assembly.

Anne McLaren sums up this area of long standing interest saying that she is particularly impressed by the progress that is being made at the present time in our understanding of the genetic and cellular basis of the establishment of the germ line.

This gem of a book encapsulates the present position in our progress towards an understanding of germ line development. Read it with imagination and you can share some of the Symposium.

Martin Evans

Chromosomes: A Synthesis; edited by R.P. Wagner, M.P. Maguire and R.L. Stallings, Wiley-Liss; New York, 1993. 523 pages. $89.95. ISBN 0-471-56124-X

Chromosomes offers first of all an up-to-date review of a wide variety of aspects related to the structure, function and behaviour of chromosomes. It begins traditionally with a good historical introduction, and a basic description of the properties of the prime constituents of chromosomes, DNA, including DNA re-association kinetics.

However, Chromosomes is not just about chromosomes – hence *Synthesis*. It bridges nicely the gaps between clasical genetics and cytogenetics, and modern molecular genetics. Throughout the book, widely used techniques in cytogenetics and molecular biology are explained in separate boxes: staining, banding and labelling of chromosomes, cloning of DNA fragments, Southern blotting, amplification of DNA fragments by the polymerase chain reaction (PCR) and DNA sequencing.

Chromosomes are not stable structures. The consequences of this plasticity is discussed in respect to natural variation and evolution, and disease states ranging from overt chromosomal aberrations to DNA repair disorders.

Two chapters are devoted to the process and regulation of transcription and how altered transcriptional regulation may be related to disorders, including congenital malformations and malignant disorders.

The Human Genome Project is the first mega-science project in biology. The basis for gene mapping is the individual chromosomes,

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Information about books for review in FEBS Letters should be sent to: Professor J.E. Celis, Department of Medical Biochemistry. Ole Worms Allé, Building 170, University Park, Aarhus University, DK-8000 Aarhus, Denmark.

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